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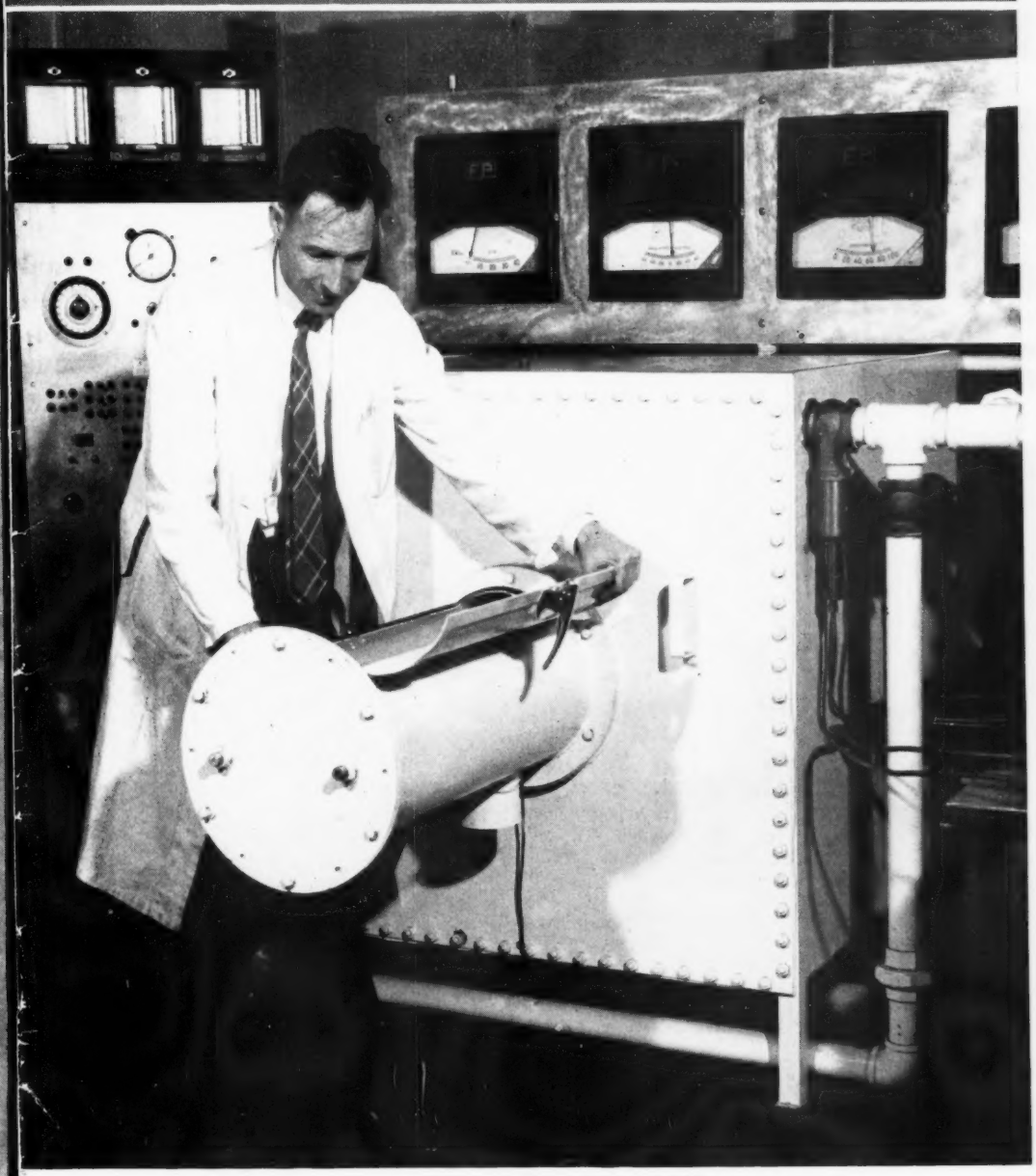

Topics

HEALTH SERVICES

DERMATITIS

BACK INJURIES
and
FIRES IN INDUSTRY

Occupational Health Division

DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA

Occupational Health Review

Volume 8, Number 4, January, 1957

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COVER PLATE

Dr. H. N. MacFarland, Head of the Research Group of the Division's Laboratory Services, is shown on our cover picture preparing a new dynamic gassing apparatus for experimental trials. This equipment designed and constructed by the Research Group, permits the exposure of small mammals to a variety of synthetic atmospheres. Investigations of this type are essential in studying the biological effects of air-borne hazards, such as toxic gases, vapours, fumes and dusts. At present this unique facility is being used almost exclusively in research on the toxicological effects of air pollutants, but will also be employed in studies on solvent vapours, new gaseous hazards and on various aerosols, including those containing metallic constituents.

*MANAGEMENT LOOKS AT INDUSTRIAL MEDICINE

by Mr. T. A. Rice,
Vice President of Manufacturing, International Harvester Company of Canada Limited.

At first glance, it would seem that this topic could be exhausted in a brief period. After all, thoughtful management cannot help but subscribe wholeheartedly to this field of the medical family because its objective is the maintenance of a healthy and efficient work force.

If this objective is attained to any marked degree, obviously the plant will operate more smoothly, loss of working time will be reduced, production will not be held up, and there will be no loss of pay to employees.

To put it even more bluntly, if the objective is attained the possibilities of profitable operation are enhanced and, after all, companies are in business to make a fair and justifiable profit.

Of course, too much stress should not be placed on the profit motive and its place in the free market economy. But profit is, in actual fact, the mainspring in a company's operations and, if industrial medicine can help keep the mainspring oiled, then there is all the more need to pay stricter attention to the medical department. And, if this strict attention is paid, then how can the whole subject be dismissed in a matter of minutes?

The Scope of Health Programs in Industry

Industrial health programs suitable for the maintenance of employee health in large or small plants are now generally deemed to consist of the following ten procedures:

1. Preplacement medical examinations.
2. Confidential health records.
3. First aid for the sick or injured.
4. Rehabilitation of the sick or injured.
5. Health education.
6. Sanitation.
7. Industrial hygiene.
8. Statistical studies of absenteeism due to sickness or injury.
9. Periodic medical examinations.
   a) Compulsory—where there is toxic or hazardous employment.
   b) Voluntary.
10. Adequate medical care in isolated regions.

The Benefits of Health Programs

The Benefits to be expected from this problem can be listed as follows:

1. Injury and occupation disease rates are reduced.
2. Compensation costs are reduced.
3. Costs of production are lowered.
4. Management-labour relations are improved.
5. Human relations are better.
6. Absenteeism is lessened.
7. Labour turn-over is reduced.
8. General community relationships are at a higher level—for as the employees think of an industry so does the community.

It is common sense that dollars and cents must weigh heavily with the majority of employers, but I suggest that there is ample evidence that many of the management group have health programs because they are helpful to their employees, even if costly. Of course it could be that, in the last analysis, management is merely another group of employees within the framework of the industrial concern and they participate equally with other employees in the benefits of a total health program.

The Health of Executives

We are apt to forget that management, too, is mortal. All too often, they, as much as the labourer who is

*A paper presented at the Joint Meeting of the Quebec Industrial Medical Association, and the Industrial Medical Section of the Ontario Medical Association held at Hamilton, Ontario, Sept. 26, 27, 28, 1956.

injured on the job, are casualties of industry. Avoidable casualties. Yet study of the relationship between the work of the executive and the stresses and strains to which he is prone is relatively new.

Many an executive is old before his time. The man who is in a state of perpetual anxiety over his work or his business, who worries whether he is at the office, at home, in his car or his club, is of little value to industry or society. Such a man has forgotten that it is possible to pay too great a price for material success. There is no virtue in excessive preoccupation with business problems to the point of a nervous breakdown. Yet such a condition is not uncommon, to say nothing of the intermediate stages.

This, however, is only one aspect of this particular problem. It is one of the major ironies of our time that as our prosperity increases, so does the rate at which industrial and other leaders of the community are stricken by cardiac diseases, frequently induced by over-anxiety and acute nervous tension of which they are never really altogether conscious. There must be a moral here somewhere.

It is only since President Eisenhower's heart attack last year that most of us outside of the medical profession have really given much thought to this problem and, even now, I am far from sure that the implications are fully realized.

The truth is, of course, that the more responsible the job, the greater the need to slow down. We may as well accept the fact that our society moves at a much faster pace than many of us can—much less need—keep up with.

"Hurry kills", while not meant to be taken too literally, has nevertheless a wider significance than mere application to road accidents. Some people insist on confusing hurry with efficiency: They don't necessarily go together. Quite the contrary. Executives, especially, need to put business problems out of their minds when they leave the office.

After all, there is nothing particularly clever in taking your worries home with you, mulling them over during dinner, and even taking them to bed with you. This tendency to become a martyr to the job, a paragon of conscientiousness, is so much nonsense and is downright dangerous in many cases.

The man who so conducts himself has lost the art of living. He does not know the tranquility and serenity which can only come from a real appreciation and enjoyment of the simple pleasures and satisfactions of life. Such a man, pursued constantly by gnawing fears about this deal or that, nagged by this problem or the other, cannot be happy, though he may sometimes believe himself to be. The point is that, not being a happy man, he cannot be an efficient executive or a leader of industry.

Initiative, energy, drive and ambition are not the only desirable attributes of a first-class executive. Indeed, there might be occasions when knowing when to slow down could be more important than any one of them.

Much of the trouble is that we are self-sufficient in the wrong things. Those who wallow day and night in the self-inflicted misery of responsibility might begin to correct their condition by following the example of Sir Winston Churchill.

His most precious asset was his ability to control his brain, so that even at the worst moments of the war he could get right off into a sound sleep in a matter of seconds. Nor did he neglect the old fashioned afternoon nap which he found an invaluable aid to mental reinvigoration after a gruelling spell of hard work. On the subject of sleep, how many of us today observe with faithful regularity, the old precept of "eight hours"? How many of us convince ourselves that we can "get by" with less, little realizing until it is perhaps too late, that we pay heavily in the end for the years when we cheated nature.

More and more companies are now taking a closer look at this question of the general health and habits of their executives. Not all carry their concern as far as one U.S. Company, which gives its executives and lower echelons of management the full treatment, even to compelling the overweights to join the company "Fat Man's Club". They must abide strictly by its dietary and recreational rules until the scales show that the desired weight has been attained.

Alcoholism

And what of alcoholism, already considered by some authorities to be *the* problem in several industries? Unquestionably, industrial medicine could do much to reclaim many of these men and women as useful members of society, thereby reducing, incidentally, the enormous amount of money they are costing industry and business in one form or another.

Industrial Psychiatry

In 1920, the late Dr. Elmer Southard, while investigating the possibilities of a psychiatric approach to industrial personnel problems, discovered in the course of a survey that 62 per cent of the more than 4,000 cases observed reached the discharge status through traits of social incompetence rather than occupational incompetence. This was a real milestone in bringing to light the very close association of social traits and working efficiency. The obvious corollaries at that time (and they have not changed since) were that the employees resented supervision and criticism, while the employers complained of insubordination, absenteeism, general unreliability, laziness, labour agitation, drinking, carelessness, fighting, dishonesty, loafing, and general violation of industrial rules. Obviously these points of friction are not the results of a lack of technical skill on the part of employees nor of incompetent industrial planning on the part of management. Dr. Southard conclusions were, therefore, that what might be termed dissatisfaction both on the part of the employer and the employee arose, not from the employee's inherent inability to do this work, but rather from his inability to adjust himself to the conditions under which he was to do the work.

Thus was shattered the misconception that maladjustment to the job was only due to one of two causes: something the matter with the job, namely, hours, wages or working conditions: or some fault of the worker in skill or intelligence or training. Over the years much work has been done, but progress is slow as all educational processes are.

The solution to emotional problems in industry cannot be the exclusive province of management, medical department or personnel. It can only be met by the closely knit co-operation of all three. Certainly the time spent on this co-operation would be amply repaid.

The Health of the Female Worker

Management and the industrial physician will have to pay more and more attention to the female employee as time goes by.

Women continue to play an ever increasing part in Canadian industrial life. The female labour force has increased from less than a quarter of a million at the turn of the century to over one-and-a-quarter million in 1956. Today women comprise about 23% of the total Canadian Labour Force, and are playing a vital role in our current phenomenal industrial expansion. A 1954 labour force survey undertaken by the Dominion Bureau of Statistics indicated that, of the five million women in Canada fourteen years of age and over, 22 per cent were in the labour force. About 55 per cent of these women were single, 35 per cent were married and 10 per cent were widowed, divorced or separated.

The conservation of the health of this very important group of workers presents a major challenge to industry and to medicine.

The Older Worker

One challenging aspect of industrial medicine is the problem of the older worker. The industrial physician can help materially in this difficulty, which has been compounded by the postwar emergence of pension plans which lay down an arbitrary retirement age, whether the retiring worker is a senior officer of the company or a simple labourer.

The advances of medical science in recent years have prolonged the expectancy of human life. One consequence is that we are not so sure as once we were that it is necessarily a good thing to terminate abruptly a man's working life in his middle sixties.

Sociologists, who not so long ago would have thrown up their hands in horror at the slightest suggestion that we should think in terms of lengthening the years of work rather than reducing them, are nowadays showing signs of a very different attitude. There is growing resistance to the arbitrary doctrine that, once he has

reached a certain age—usually 65—a man should be compulsorily retired irrespective either of the state of his faculties or his own inclinations. The wheel has turned pretty nearly full circle.

The results of various social studies of those who have retired or, more often, have been retired in recent years provide one explanation for this remarkable change in the trend of opinion. Many, apparently, are far from contented with their lot. "Distance doth lend enchantment to the view" and the goal of retirement on a tolerable pension which looks so attractive to the man in his forties or fifties frequently proves on achievement to be empty of the promise it held out for so long.

It should seem that we have all underestimated the mental and physical effects of "putting out to grass" the still alert and vigorous man whose work has meant more to him than he, or anyone else, ever suspected. Release from the cares and responsibilities of his daily tasks is sometimes poor compensation for the loss of the companionship of fellow workers and, even more important, his own feeling of being needed, of having value. Left to putter about at home and at the club, reduced to making a full-time occupation of his hobbies, his faculties may erode.

To imply that these are the reactions of every retired worker would be to overstate the case. They are common enough, however, to warrant serious thought, the more so since the number of Canadians now over 60 exceeds 2½ millions—one in six of the population—and the proportion will undoubtedly continue to rise.

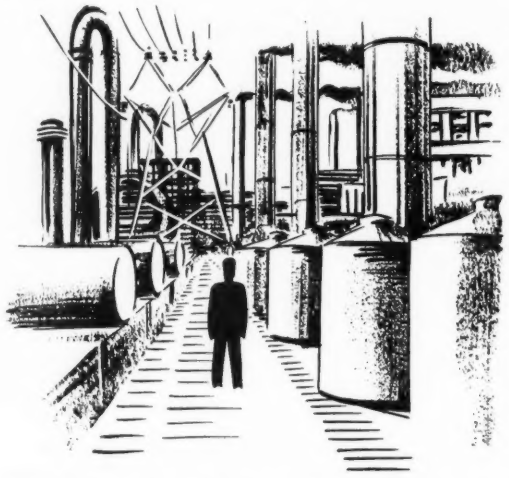
Apart altogether from psychological considerations, there is the waste involved to society in general and industry in particular in denying themselves the productive capacities, the knowledge and the experience of men who are willing and able to continue—or return to—work and are reported medically fit to do so. The suggestion that such employees should be retained on a part-time basis, as is done in some European countries, would seem to have much to commend it.

While there are certainly obstacles to such an alternative to outright retirement, they are far from being insuperable and the advantages to all concerned, the individual, society, and industry, merit serious consideration. The main thing is that we should get away from the idea that there is some immutable, if unwritten law which decrees that a man of 65 or so must thereon be written off as a productive worker.

A wise bishop of Sweden once remarked that one good measure of any society is the care and forethought with which it handles its older people. The same might be said of management.

The Importance of The Individual Worker

What vision does the phrase "modern corporation" conjure up? The answer of course, is that our mind's eye sees huge industrial plants sprawling across acre after acre, the sky overhead silhouetted by cloud-streaming smokestacks. We think of assembly lines with finished products rolling off at half-second intervals, of row on row of whirring machines with a few highly trained technicians, of thousands of automobiles in the parking lot outside the plant, of million dollar payrolls and of the floating of bond issues and production quotas unbelievable 20 years before. All these concepts and many others are webbed to our image of the modern corporation.



Yes, the concept of the modern corporation is rooted in its hugeness, its vast size, the astronomical figures associated with every aspect of it. Perhaps that is why, all too often, we tend to forget the individual employee who, obviously enough, is the backbone of the vast enterprise.

The modern corporation must pay more attention to the man; it is as simple as that. The late John D. Rockefeller once remarked: "Perhaps it is worthwhile to emphasize again the fact that it is not merely capital and plant and other material things which make up a business but the character of the men behind these things, their personalities and their abilities: these are the essentials to be reckoned with."

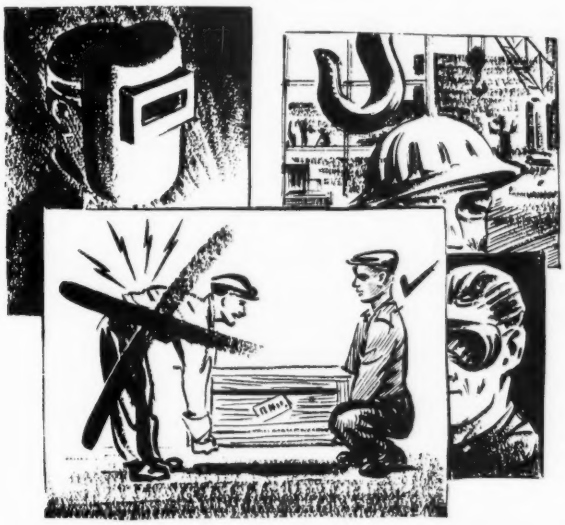
Accident Prevention

Management must not be content to sit back in its corporate chair and relax in the knowledge that its medical department is operating at 100 per cent capacity.

It must never forget that prevention is better than cure. It must concentrate as much on accident prevention as on industrial medicine because in this, as in everything else, it is a little late to lock the barn door after the horse has been stolen.

In fact, we must never stop aiming at solving the problem of accident prevention on a national basis.

And this poses a question in the mind of progressive management: What can we do to reduce further the



number of work injuries among gainfully employed men and women and thus reduce the drain on Canada's business economy?

The answer is that we must continue to determine and do away with the underlying causes of accidents, whether they are mechanical or whether they are human, or whether the fault is that of management or that of the employee.

Since industrial accident prevention started on an organized basis in Canada, many satisfactory results have been obtained and many industrial and commercial concerns have shown great reductions. It has been proved that accidents are not a necessary by-product of a business, but the whole problem is still one of constant education.

We must continue to encourage management personnel in their fight against accidents. We must show them that reduction in accident frequency represents a great saving in money, not to mention the fact that the greatest dividends come from the saving of lives, limbs, homes and human suffering. We must prove to them that improvement in productivity and accident prevention march hand in hand. We must show them that safety is just as much a part and parcel of industrial life as is industrial medicine. The one must complement the other for the betterment of Canada's business economy.

METHYL CHLOROFORM

The findings reported recently by the Hygienic Guides Committee of the American Industrial Hygiene Association indicate the remarkable safety and use of an all but unknown solvent material, methyl chloroform. This committee of scientists, comprising specialists in the control of industrial health conditions, reports its findings after review of the thorough animal experimentation tests conducted on the material.

The solvent which has become commercially available only recently, looms as a substitute for the dangerous carbon tetrachloride. Although almost identical in physical and cleaning properties it is shown to be much less likely to injure the user in almost every application where hand cleaning at room temperature is done.

In the case of methyl chloroform, general ventilation is considered sufficient for brief exposures or those resulting from very small quantities of the solvent. With prolonged exposures or with elevated temperature operations, process ventilation will be required. Recommended control procedures for high hazard carbon tetrachloride state, "If carbon tetrachloride must be used, the operation should be adequately ventilated and isolated from the general working space".

Recommended Maximum Atmospheric Concentration (8 Hours) for methyl chloroform is 500 parts of vapour per million parts of air, by volume (ppm), while that for carbon tetrachloride is 25 ppm.

A comparison of the two solvents shows their great similarity for cleaning purposes. Both are insoluble in water, but are miscible with alcohol, ether, acetone, benzene, and with each other. Methyl chloroform will react violently with unoxidized aluminum and certain other metals, but it is now readily available from five or six commercial sources in stabilized form to eliminate this underisable property of the technical grade chemical.

Information on this solvent is contained in one of the Association's Hygienic Guides mentioned below.

HYGIENIC GUIDE SERIES

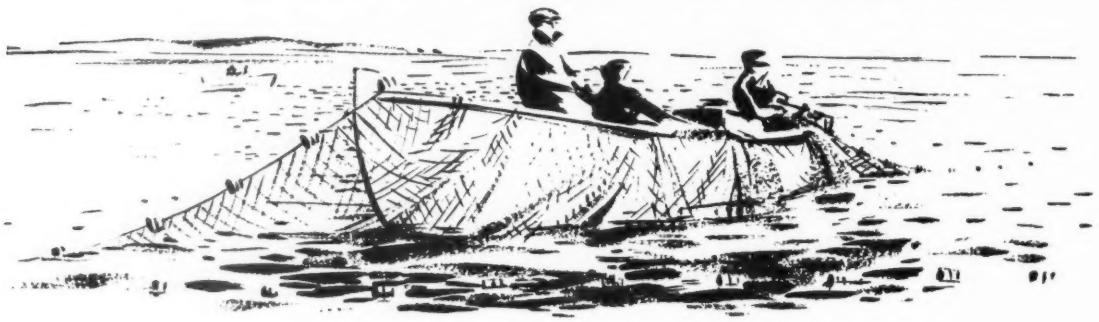
Continuing their aid to industry in preserving the health of its employees, the American Industrial Hygiene Association has added five more subjects to their series of Hygienic Guides. The recent additions, published in the current issue of the American Industrial Hygiene Association Quarterly, are on carbon disulfide, ethylene dichloride, hydrazine, methylene dichloride, and nickel carbonyl.

Each Hygienic Guide is devoted to one material. It contains the latest available information on potential hazards, maximum allowable concentration to which employees may be safely exposed over long periods, and engineering and medical methods of control. Major uses in industry and references to technical literature on the subject are also given.

The subjects of previously released Guides include acetaldehyde, amyl acetate, anhydrous ammonia, aniline, arsine, benzol, beryllium, butyl alcohol, cadmium, carbon monoxide, carbon tetrachloride, chromic acid,

(Continued on page 20)

* DERMATITIS IN THE FISH INDUSTRY



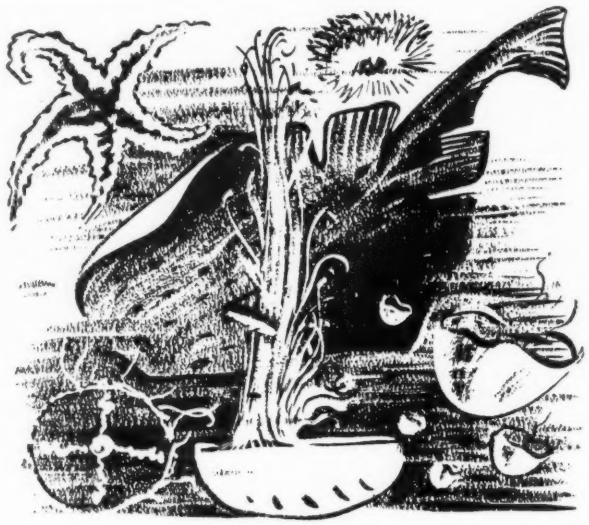
By Arnold V. Raison, B.A.,
Technical Editor, Occupational Health Division

Dermatitis is the chief occupational hazard among fishermen and fish handlers. Although many of these infections are common to all fishermen, their frequency, severity and types are influenced by certain specific factors including climate, type of fish and other sea animal handled, eating habits, sanitation, type of fishing vessel and the length of the voyage.

The most common afflictions suffered by fishermen and fish handlers are:

1. *Skin abrasions, lacerations and cuts* — These conditions develop from the handling and contacting the many sharp and irregular objects peculiar to the fisherman's trade, ie, fishing gear, packing boxes, sharp, bony spines of fish, etc. These areas may become secondarily infected with staphylococcus and occasionally streptococcus, particularly due to contact of dirty oilskins with the injured area. Such lesions are like ordinary boils and they respond readily to cleanliness, hot compresses and prevention of further irritation. They are commonly called "pigeons" by the fishermen.

2. *Bites and Stings* — Dogfish sharks are often picked up with a fish catch and bites from these have been known to occur on occasion. Skin irritation and infection also develop from the stings of sea animals such as certain rays, the sea anemone, the jellyfish, Portugese man-of-war and sea nettles. Eye inflammations which occur during washing of sardines are probably due to the presence of parts of jellyfish or sea nettles adhering to the scales of the sardines or to hydrogen sulphide evolved from decaying fish.



3. *Redfeed Dermatitis* — This affection is contracted from mackeral during the months from June to September, when these fish feed on small reddish-orange crustaceans called 'redfeeds'. Fish which have fed on 'redfeeds' do not keep well after being caught. The flesh softens and after 24 hours it is broken down to the spine; hydrogen sulphide is given off during this process. The ingested redfeed along with the stomach

*This article was originally published in The Fisherman, the publication of the Organized Fishermen and Shoreworkers of British Columbia.

digestive juice of the mackeral casues burning of the hands and is referred to by handlers as "red pepper" or "cayenne". Continued exposure causes painful swelling, intense redness of the hands with many small ulcerations; the palms and sides of the fingers are chiefly affected. These lesions heal quickly on application of boric acid or epsom salts soaks followed by boric acid or zinc ointment, provided that further contact is avoided.

Contact with the skin of the skipjack, a west coast fish closely related to the tuna, also causes dermatitis, which develops on the forearms above the gloves about a week after starting work. Dermatitis is more likely to result from handling spoiled fish than from unspoiled. The skin of the skipjack contains a primary skin irritant which causes dermatitis when it comes in contact with unprotected areas of the skin of handlers.

Skin punctures are often suffered by fishermen during hand-filleting of rosefish, (also called redfish) which are found in large quantities in Atlantic waters.

In filleting, the worker grasps the head in his left hand and cuts the meat off the bones with his right. The rosefish has many spines extending back from its head, and unless grasped carefully, a skin puncture may occur. These can be very painful and may be followed by certain glandular involvement. Infections from this source have decreased considerably in recent years.

4. *Erysipeloid* — This condition is rare on the west coast but frequently found among Atlantic Coast fishermen. It is contracted chiefly from handling fish offal (commonly called gurry) or decayed fish. The development of erysipeloid is always accompanied by a history of skin injury, usually puncture by a fish bone. If bleeding is free, infection is rare; if there is no bleeding, almost invariably infection occurs within a period of several hours up to one or two days. The disease always occurs on the hands, with first appearance at the site of the skin injury, and it is characterized by some pain, swelling and redness. The swelling becomes purplish in colour, progresses down to the web of the finger, and often ascends up the next finger, this giving rise to the worker's term of "run around".

The advance of the infection is slow and clearly demarcated by a line of redness. The infected area is slightly elevated around the outer edge and depressed in the centre. Swelling may be severe and incapacitating in some cases. Rarely, there are arthritic symptoms which persist after the skin affection had disappeared.

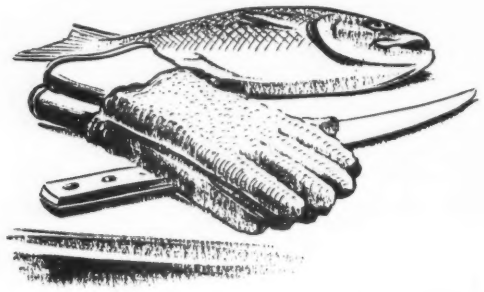
Generalized infection resulting in death has occurred in a number of instances, most frequently from handling fish some considerable time after they have been caught. There is inflammation of lymph glands with pain and tenderness of the forearm and upper arm.

5. *Skin Cancer* — Exposure to excessive sunlight is considered to be a cause of skin cancer and the frequency of this condition is increased by the presence of tar on the skin. Fishermen use tar to prolong the life of their nets, and to impregnate ropes, cables and tarpaulins, and while mending the nets many have the habit of holding the needle in the mouth. A number of cases of lip cancer among fishermen have been attributed to this exposure to tar and sunlight.

6. *Allergy* — Certain people are allergic to fish oils and develop dermatitis from contact. Such cases usually occur among persons handling cooked fish.

7. An unusual type of skin infection which commonly occurred among Alaska fishermen has also been reported. This infection is characterized by pain, swelling and dark discolouration. Closer examination of the area reveals a small break in the skin which exudes a drop or two of clear or slightly cloudy serum when squeezed slightly. The condition is accompanied by discomfort, often a slight headache, and low grade

fever. Swelling and pain may be quite marked and an original small lesion on a finger may spread over the whole hand and sometimes the wrist. The infection spreads between the inner and outer layers of skin,



separating the layers and resembling a collapsed blister containing a few drops of cloudy serum. This spreading may continue for 5 or 6 days accompanied by burning and pain extending up the arms. During healing the outer layer of skin dries and sloughs off.

8. *Weil's Disease* — Although not a primary infection, this disease occurs often among fish workers from infection by infected rats. Rats are often found in fish handling establishments and since workers often have abrasions, cuts, etc. of the skin, they may develop the disease from the rats themselves or from materials with which the rats have been in contact.

The disease, characterized by fever, jaundice, and subcutaneous haemorrhages, develops in four to nineteen days after contact. Diagnosis is made by positive serological agglutination tests.

9. *Other Agents Capable of Causing Dermatitis*— Various agents, other than fish, may cause dermatitis among fishermen and fish handlers:

(a) The alkali used to clean sealed cans of fish may occasionally cause skin irritation.

(b) Salt Water—Among Australian fishermen, ulcers commonly referred to by the fishermen as "salt-water sores" have been reported. These ulcers are round or oval in outline, with only slightly raised margins, and are attributed to devitalization of the skin from constant immersion in salt water especially among persons predisposed to this condition through nutritional deficiences.

Prevention of Poisoning

Although skin infections among fishermen and fish handlers are frequently not serious, they do occasion considerable discomfort and sometimes necessitate loss of working time or at least decreased work efficiency. Therefore it is essential that every precaution be taken to guard against them. Proper washing of the exposed skin areas and good health habits generally will do much to prevent the occurrence of poisoning. As a precautionary measure, it is suggested that when working on jobs where there is danger of infection, employees should wash their hands and arms with a dilute germicidal solution such as 0.1% sodium hypochlorite (Dakin's Solution) or 1% of a commercial cresolic compound such as "Lysol", or "Izol". In addition, a skin softener should be used, especially by workers with naturally dry skin, to prevent chapping and possible subsequent infection.

Another mode of prevention is through the use of rubber gloves, equipped with treads on the fingertips to enable the workers to handle the slippery fish. These should be heavy enough to prevent puncture by fish spines or other sharp objects. Alternatively, a light rubber glove may be worn with a cotton glove over it to provide a gripping surface. These gloves should be kept clean, and the hands washed thoroughly after work. Fresh water washing of all areas of the body which have been exposed to salt water will do much to prevent salt water ulcers. Areas of the skin which may be exposed to friction from oilskins should be kept clean and wherever possible, a softer material worn over the area to prevent rubbing of chafing. Factory and boat hygiene should be carefully supervised. Thorough washing of the hands, arms and face is essential before eating, and lunches should not be eaten in an area where fish are handled. Infections may also be transmitted through smoking while working.

Treatment — All infections should receive medical care as soon as possible because neglect may lead to serious complications. From all reports the introduction of penicillin and other antibiotics into treatment of fish poisoning has proved very effective.

In summary, it may be said that the most important features in the prevention of fish poisoning are good personal hygiene and strict adherence to health and safety rules and regulations.

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THE RUPTURED INTERVERTEBRAL DISC SYNDROME

By Jean Sirois, M.D.,
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The controversy about the existence of the ruptured intervertebral disc syndrome has now been reconciled and the syndrome so well described by Mixter in 1934 is generally accepted.

This material is presented for the purpose of clarifying some controversial points about the syndrome and eliminating any misunderstanding which may exist between the patient and his doctor, be he a general practitioner, orthopedic or neurosurgeon, medical adviser of an insurance company, industrial medical officer, or other qualified medical officer.

Any controversy about the acceptance of a case with a disc syndrome is usually centred around one of the following points:

1. The symptoms and signs—
2. The means of making a diagnosis—
3. The treatment—

SYMPTOMS AND SIGNS

One peculiarity of this syndrome is the fact that usually there is a long lapse of time between the occurrence of local pain at the time of injury and the symptoms of root or spinal cord involvement, and this delay has been the cause of refusal of cases for compensation or acceptance only after long observation and examinations by experts of all kinds.

This misunderstanding is due to the fact that many doctors are not aware that the symptoms of a ruptured intervertebral disc are of two types:

1. Symptoms and signs caused by the disruption of the disc itself.
2. Symptoms and signs due to the compression of the nerve roots.

1. Symptoms and signs caused by the disruption of the disc

The patient presents a history of a definite injury, from local impact or from a strain, followed by days, weeks or even months of only local pains (lumbar region), muscle spasms, some loss of the normal curvature of the spine, a list or scoliosis and some loss of ability to bend the back.

Any strenuous effort will elicit pain. The position which gives the patient relief will vary from person to person. Usually a hard bed will be most comfortable. Walking about will give partial relief. Sitting in a chair, and in particular a soft lounging chair may cause acute discomfort.

The strain can be caused by lifting a heavy weight, a sudden increase in lifting, a twisting or snapping of the spine as in an automobile accident, or even by the muscular exertion of child birth.

This preliminary period may be long and the patient may even be able to return to work after a few days rest. There may also be a period of almost complete remission of symptoms during which time the patient has only slight discomfort or pain occasionally over the lumbar region but never any sciatic pains.

The physical examination at this time shows only local pain or tenderness, muscle spasm, and some listing of the spine. There are no muscular changes, atrophy or weakness, no sensory disturbance subjectively or objectively and no reflex changes.

Since there is no radiation of pain and neurological and X-ray examinations reveal no abnormality, the condition is diagnosed as a torn or ruptured ligament, lumbago, or ruptured muscles.

Unfortunately these findings are kept on file and served against the patient's claim when the roots symptoms and signs appear much later.

Much dissension could be avoided between labor and management and especially the industrial doctor if this point were known and understood by all concerned and most of all if the medical or expert report were to be accepted at face value.

2. Symptoms and signs due to compression of the nerve roots

Quite often a very slight strain or bending movement will cause the onset of very severe nerve root symptoms and signs.

The pain is intense—of a shooting, burning or tightening type—radiating along a definite nerve root of the plexus. It is increased by movements or by standing in the same position for a long period of time, sneezing or straining at stools. There is some limping, marked curvature of the spine, and a sensation of numbness over the dermatome.

The neurological examination shows marked contracture of the lumbo-sacral muscles, a well localized painful spot with radiation of the pain when pressed and limitation of all the movements of the lumbo-sacral spine segment with a positive laseque sign. Sometimes there is some well localized muscular weakness or a slight atrophy. The corresponding tendon reflex may be diminished or absent and a localized hypoesthesia may exist over the painful dermatone.

There are two points which deserve emphasis: I. The reflex changes in many cases cannot be elicited and even at times they may be contradictory. Weakness and atrophy of muscles may be of value, but in some, no weakness can be found and in others, pain will prevent the patient from using his muscles to full capacity. II. Hypoesthesia is the most reliable indication of a ruptured disc and of its location.

The two groups of symptoms and signs described above are accepted in most neurosurgical centers and services.

It is generally assumed that at the time of the injury or strain there was just a displacement of the disc which presented a very definite syndrome as described in the first group.

The interval, of variable duration, during which there are few, if any, symptoms, is considered part of the entire syndrome, in the same manner as is the symptom free interval between a head injury and the epi—and subdural hematoma.

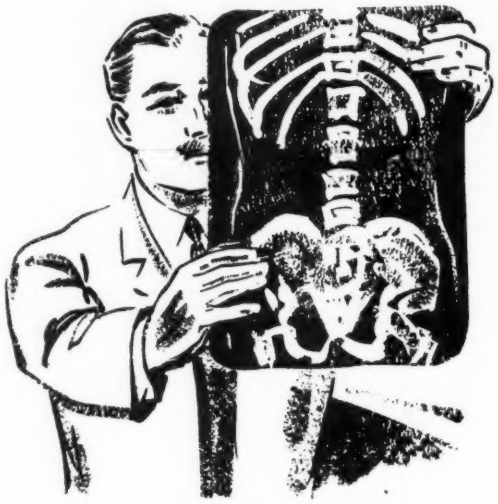
That is why many times the surgeon will ask that a case be accepted even though the second group of symptoms and signs appeared suddenly after a benign movement or strain, provided that he has obtained an accurate history of the first group of symptoms and signs.

DIAGNOSIS

Besides the pathognomonic clinical evidence of a displacement or a ruptured intervertebral disc there are other means which may help to make a diagnosis.

Of course in all cases, an X-ray of the lumbo-sacral region is a must in order to rule out any other pathology of the vertebrae, such as fracture, dislocation, a primary or metastatic tumor, Potts disease, etc.

If there is a ruptured disc or even only a displacement the pain causes muscle spasms and the normal curvature of the spine is changed. There is a straightening of the spine and if the rupture is complete the narrowing of the intervertebral space can be easily seen. Sometimes some Schmorl nodules are visible.



The simple X-ray of the spine is of great help and should be accepted as such in all cases.

Another diagnostic measure is the injection of an opaque medium, an iodine compound, such as Lipiodol or Pantopaque, into the spinal canal to permit fluoroscopic or X-ray examination. This process is called myelography. In some instances the medium may be injected directly into the disc through the intervertebral space and the process is called discography.

Both of these tests are very time consuming and painful to the patient.

In addition, there are other factors which must be considered. The opague medium, being a foreign substance, must be removed from the spinal canal. In about fifty per cent of the cases, this may be easy, although about ¾ of a c.c. usually remains despite all efforts. In the remainder only about half of the medium can be aspirated easily, and in order to remove part of the remainder, it is necessary to withdraw a considerable amount of spinal fluid at the same time. This causes the patient severe headache, nausea, vomiting, and confinement in bed for a few days.

The remaining medium may be absorbed but there are many reports of cases who have developed an arachnoiditis with severe neurological sequelae.

Many doctors think that it is very simple to read a myelogram, either fluoroscopically or on X-ray film. Nothing is so far from the truth with a disc syndrome at the dislocation or the ruptured stage.

The filling defect is often difficult to see depending on many factors such as: The adaptation of the eyes to fluoroscopy; the thickness of the patient; and many other anatomical factors which can simulate evidence of a disc injury.

Best results are obtained if the disc is ruptured centrally; if it is centro-lateral the filling defect is inconstant. If the rupture is plain lateral there is now no question of filling defect but the interpretation is based only on the extention of filling into the sheath of the nerve roots, which much too often becomes a question of personal interpretation.

And finally if the rupture is complete and the root is compressed by a free fragment (which by the way does not present a classical syndrome) the myelegram will always appear normal.

Myelography is far from being a benign procedure. Contrary to popular opinion, myelography should not be depended on as a positive means of making or rejecting a diagnosis of a ruptured disc, and definitively it should never be made compulsory to a patient by any insurance company or commission. The use of myelography should be left to the discretion of the treating doctor.

Besides the above mentioned there are other reasons why myelography should not be done for all cases:

1. We know that quite often a normal myelogram is found with a disc syndrome.

2. If the clinical case is quite classical, subjectively and objectively, and the pains are severe, why do a myelogram when we know quite well that even if it is doubtful or normal we will advise the operation just the same if the syndrome is of long standing and all other medical means of treatment have failed?

Personally I do a myelogram when clinically the case is doubtful and when my decision is made not to advise the operation but to propose medical treatment if the myelogram is found normal.

To outline rather quickly the general principles on which the clinical diagnosis should be made the three following paragraphs can serve as a key:

1. Any young or middle-aged patient, with a virgin pathological past history, who is complaining of low back pains even without nerve root symptoms or signs after an injury or any kind of strain (especially if the pains appear right after the accident and X-ray examination reveals no bone pathology) should be considered as having had displacement of a disc.

2. Any patient presenting a history as indicated in 1, and who for an undetermined time, no matter how long, has had alternating interval of localized pains and intervals of freedom from pain, and later has developed, suddenly or progressively, typical symptoms and signs of nerve roots compression, should be considered as having a ruptured intervertebral disc. The cause, without any doubt, should be accepted as being the accident or the strain mentioned in the history.

Any patient who develops typical and constant symptoms and signs of nerve root compression a few days or weeks after the accident should be diagnosed as having a ruptured intervertebral disc if X-ray examination reveals no bone pathology.

TREATMENT

1. The conservative method of treatment for at least 2 or 3 months after the first displacement or rupture is: back support, rest on a hard board, extension, or paster cast.

2. If this treatment eases the pain it should be continued even if the patient has to do light work for some time.

3. If another attack occurs without nerve root compression symptoms or signs the same treatment should be applied.

4. When the nerve roots compression symptoms and signs appear after the free interval, conservative treatment should be tried again for a few weeks, but if the pain persists surgery is indicated.

5. Finally, if the first attack manifests itself by nerve roots compression symptoms and signs, the conservative treatment should be tried for a few weeks and then surgery advised if there is no relief of pain.

6. Spinal fusion should be done on the patient with spondylolisthesis, sacralization, or lumbarization.

Patients with such congenital defects are more apt than the others to rupture an intervertebral disc, and the presence of any such defect should count in favour of, rather than against, a patient's acceptance for compensation for disability from a ruptured intervertebral disc.

NEW PUBLICATIONS

Pamphlets—1. A new two-fold pamphlet entitled "Respiratory Protection" has recently been released by the Occupational Health Division. This folder contains useful information on the purpose, requirements, types, uses, and care of respiratory equipment. It is well illustrated, and all information is presented in a simple concise manner.

This pamphlet produced in both English and French, is intended for distribution to individuals who are required to wear some form of respiratory protection at work, and is available from Provincial Directors of Health Education.

2. A second folder dealing with safety precautions for handling or using solvents will be available in the very near future.

Reprints—Due to a unprecedented demand during the past year for copies of the Occupational Health Bulletins containing information on certain topics of general interest, the Division has instituted a system of reprinting of such materials in folder or pamphlet form.

Manual Artificial Respiration—the arm-lift, back-pressure method, and

Hazards of Low Voltage Electricity.

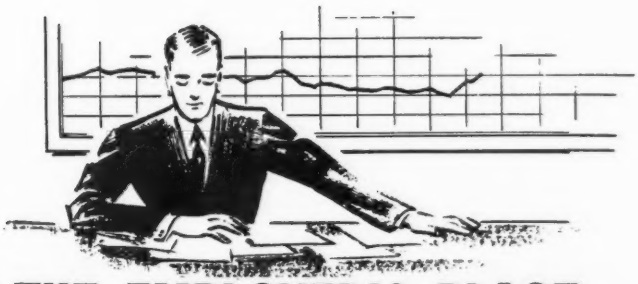
At present, these reprints are available only in limited quantities, but it is hoped that larger quantities will be produced if the demand warrants.

New Anatomy Chart Series For Nurses

The Industrial Nurses' Section of the Illinois State Nurses' Association has recently supervised production of a series of anatomical charts for use by nurses. The series is made up of 16 individual 8½" x 11" charts, printed in two colours on white paper and inserted in a plain folio envelope for convenience. The charts comprise the following:

1. Anterior View of Head with Landmarks
2. Arteries of Head and Neck
3. Superficial Nerves of Head and Neck
4. Top of Skull with Landmarks
5. The Eye
6. Outer Ear—Section Through Auditory Apparatus
7. Toros with Viscera
8. The Heart
9. Upper Limb—Anterior View Showing Arteries and Nerves
10. Upper Limb—Anterior View Showing Musculature
11. The Hand Showing Arteries, Nerves and Tendon Structures
12. Lower Limb—Anterior View Showing Arteries and Nerves
13. Lower Limb—Posterior View Showing Arteries and Nerves
14. Tendons and Tendon Sheaths of Anterior of Foot and Ankle
    Superficial Nerves and Arteries of Foot
    Sagittal Section of Ankle and Foot
15. Anatomical Regions of the Body...Anterior View
16. Anatomical Regions of the Body...Posterior View

These charts are available through the Illinois State Nurses' Association, 6 North Michigan Ave., Chicago, 2, Illinois, U.S.A. for $2.50 per set, including postage.



* THE EMPLOYER'S PLACE IN AN OCCUPATIONAL HEALTH PROGRAM

By Miss Mildred I. Walker, R.N., M.A.,
Senior Nursing Consultant, Occupational Health Division

Why should an employer supply a health program for those who work for him? Can we prove to him in dollars and cents that he should? He must make a profit or he will go out of business. He must take risks, take chances on new products, new people, new employment policies and practices. And in it all, his assets must be greater than his liabilities. Here are some answers: it is good business to have an adequate health program, as well as a benefit program, to attract employees to the company, and encourage them to remain. In any community most companies today want to be identified by their employees and members of their families as a "good company to work for".

Generally speaking, a growing company with good working conditions is constantly expanding its output, improving its efficiency and increasing the individual productivity of its employees. This process usually results in periodic increases in pay—and some of the increase may take the form of health and security benefits, particularly when a company can extend services which may be of greater value per dollar to the employee than an actual wage increase. It should be noted that a health benefit is part of the wage paid, not a gratuity, especially for non-occupational health and sickness services. A survey of fringe benefits in the United States, incidentally, shows fringe benefits total about 1.8% of the amount of the payroll.

Even if an employer or the management of a company does realize the economic and humanitarian value of healthy, well-adjusted workers, he may not know how to obtain the service. Here is where the public relations of health professions begins and continues. This is where you and I come in.

It might be well to recall what is meant by management and to consider the different kinds of employers. What do we mean by management? We mean either an individual employer, a family, stockholders, trustees as in a university, government or any group of people who are delegated to operate a business for its owners. Management can also mean the techniques that managers employ in accomplishing their objectives.

In the textbook "Personnel Administration" (1), management is spoken of as the technique of getting effective results with people. A good administrator gets people to work with him—a kind of leader for whom employees wish to do their best. He does this in collaboration with others in his organization, and all the technical competence in the world will not suffice if his subordinates are working against him or grudgingly for him. The problem of winning wholehearted cooperation is the central, ever-present problem of management. Thus, there is mutual dependence between employer and employees.

Now let us look at the employer, or the most senior executive officer. What are his basic beliefs about

*Reprinted from the Canadian Public Health Journal, October 1956.

people and work? What is his administrative philosophy? Does he do everything himself, or does he delegate authority, or does he just let things run? Other considerations are his training and background; his history with the company; the circumstances relating to his rising to the top; his age; and the influence of formal organizational pressures and informal pressures. Finally, it is important to note the decision-making type which he represents. To make a decision he must accept the responsibility for it. That is what makes managers different from workers. However, the employees help him to improve his competitive position—interest begets interest and health personnel are a real strength in the total employment picture. It might be remembered that a president of a company is generally considered to spend three-quarters of his time in the human relations aspects of his company and only one-quarter on long- and short-term planning.

Every employment situation is similar but each has unique characteristics. And so we must recognize what variety of work hazards exists and the protection necessary for the personnel who assist in this particular production. Food-handling industries must stress strict health and sanitation standards, while chemical-producing companies must watch for situations in which chemicals may constitute a physical hazard.

In regard to the employee, every public health worker should know the conditions of employment by which the family lives. Obviously the economic picture of the family looms as a large factor in the success of the community and provincial health services.

What should the employer expect from an employee? He should expect, for one thing, physical ability. The worker should be able to meet the physical demand of the job. And in this connection it is noted that when the physical abilities of handicapped people are successfully matched with the requirements of jobs, disabilities do not constitute a job factor. The employer will also expect that the worker should not be a hazard to himself or to other workers. He should not expose himself to dangerous work habits and should respect the rules of safety. The management should know about the personal health of the worker. For example, if a worker has a skin allergy, the management should be aware of this fact so that it may be able to arrange suitable work.

The same principle applies to other conditions such as diabetes, or other diseases which an employee may have and which will not be a hazard if he is properly placed in his job.

OCCUPATIONAL HEALTH PROGRAM AS PROVIDED BY MANAGEMENT

Care and Treatment

Management as an employer or as a team provides medical direction, keeps the personnel of the employees' health service informed about new plant processes and materials, and provides adequate space, equipment and supplies.

Physical Examination

Management provides information about job demands, materials and processes. The industrial (plant) physician does the physical examination and determines the prospective employee's physical fitness as a factor in placement.

Health Education and Counselling

Management does four things. It includes health education in a training program for new employees. It provides space and facilities for pamphlets, posters and meetings. It approves and supports cooperation with community programs and surveys, and it provides space for private counselling. The industrial physician and nurse participate in planning the scope and methods

of health education programs and in actual counselling and health education activities.

Safety

Management provides five things: provides safe environment and equipment; keeps its plants sanitary; handles Workmen's Compensation and insurance benefits; provides channels for keeping the employees' health service informed about benefits, particularly changes; and provides facilities and time for training of first-aiders.

Coordination with Community Health Programs

In addition to participation, members of management give support to community programs such as chest surveys, civil defence programs, and approve observation or experience for visiting or student nurses. The plant physician and nurses keep in touch with local physicians, hospitals and community health and welfare agencies.

Supervision of Illness-Absence

Management keeps the employee health service informed of illness-absence and accepts the physician's or nurse's opinion about the need of the employee to go home or to return to work. The physician works with and through the family physician on illness-absence cases of long duration.

Records and Reports

Management accepts the confidential aspects of medical records. The physician participates in deciding on the scope and content of records and may write some or all of the monthly or annual narrative reports. The nurse keeps the daily log and the individual records of employee visits which are the basis of the monthly and annual reports of the health service to the executive officers.

Administration

Management gives whole-hearted understanding and support to employee health services and programs, and provides medical direction with access to top management, machinery for orienting new employees to health and safety services and written policies under which the employee health service is to function—policies in which the physician and nurse participate in formulation. Management also keeps the employee health staff informed of new processes, materials, benefits and agreements; recognizes legal, ethical and professional principles of medical-nursing service in industry; establishes rates of pay in keeping with the status of the doctor and nurse; and recognizes the need for doctors and nurses to attend and participate in professional meetings.

All this is possible only through good communications. The nurse and physician must always interpret their services to members of management and employees. We are too prone to think that our value should be recognized without this interpretation, although our value in dollars and cents has been proved beyond doubt where good service to industry has been given and understood.

Large industries have already realized the value of health services. Figures for Canada, the United States and Britain show that large industries, numbering only 2% of the total number of industries but employing about 30% of all workers, now have health services. Small work situations, however, have very little or no health service available to their workers.

The greatest need is to interpret this idea of a health service to all employers and to find the personnel who have an understanding of it. When this level of achievement is reached by health personnel, the goal of health services with the family unit as the basis will be realized.

*FIRES IN INDUSTRY

By C. N. Davies, D.Sc., F. Inst. P.,
Hon. Editor, British Occupational Hygiene Society.

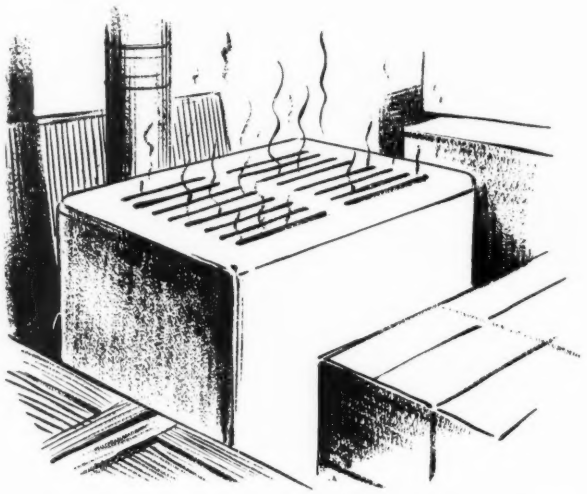
The British Occupational Hygiene Society held a conference on this subject in London on November 12th, 1956, at which the Chair was taken by the President-elect of the Society, Dr. P. Pringle, Chief Medical Officer of the Central Electricity Authority.

The proceedings were opened by Sir George Barnett, H. M. Chief Inspector of Factories, who said that the current year had seen great activity devoted to the diminution of economic loss and the risks to personal safety due to industrial fires. Broadly speaking, some aspect of human behaviour was usually the cause of a fire and this was a difficult thing to control by rules and regulations. Legislation was mainly directed to restricting the spread of fires and ensuring the safety of workpeople. An important principle of safety was the separation of escape routes from process rooms; stairways should not be open to the room they served but isolated by self-closing doors. Open stairways were liable to hinder escape and encourage the spread of fire. Vertical spread was also promoted by the existence of open hoistways which should be prohibited.

The first paper, "A technical survey of fires in industry", was read by Mr. N. C. Strother Smith, Director of the Fire Protection Association. Statistical analysis had shown the existence of some fifty different causes of fires. The prevention of outbreaks resolved itself into the separation of potential sources of ignition from ignitable materials.

The most common source of ignition was some form of heating equipment worked by coal, gas, electricity or oil, including blowlamps, cutting and welding gear and smokers' materials. Overheated electric cable, electric sparks, and sparks or heat from mechanical friction were also encountered.

Prolonged heating at temperatures down to 150°F. could cause charring of cellulose materials. Convection heaters could become too hot if free access of air was impeded by stacking or draping materials near them. Friction in bearings and conveyor belts was common and sparks caused by foreign objects getting into machinery had been known to ignite textiles being processed.



The fire risk associated with a substance depended on its physical properties. Solids having low values of density, specific heat and thermal conductivity were most readily ignited. Vapour density, vapour pressuer and flash point governed the ignition of liquids. Proximity to the source was a factor with solids, but not necessarily so in the case of liquids, because the vapour was mobile. Gases were subject to concentration limits between which explosion was possible, and density was also important. The risk from dusts arose both in deposits and in airborne clouds. Chemicals which released oxygen were particularly hazardous, and spontaneous combustion, especially in stored materials, had to be watched out for.

*A summary of proceedings of a Conference held by the British Occupational Hygiene Society, November 12, 1956.

Fires were spread by the release of hot gases and the formation of combustible gases from heated organic substances, which might flash when oxygen was admitted, perhaps by the breaking of a window. Good conductors, like metal beams, might also cause a fire to spread if they were directly heated by flames. Burning liquids could flow under doors or down shafts, and explosions raised dust and might rupture vessels containing further incendiary material. Indiscreet encouragement to spread was given by poisonous gases and fumes which impeded fire fighting.

Whenever possible fire-separating walls and floors should be used to assist in confining possible outbreaks. Staircases, lift shafts, conveyor openings and ventilating ducts provided paths for spread.

Fire records showed that the blame for most fires rested on the shoulders of industrial management; failure to maintain machinery properly, to inspect vessels used for inflammable liquids, and to study and supervise possible hazards indicated a lack of understanding by management of how fires developed. Mr. Strother Smith quoted many examples to illustrate his points.

The vital safeguards for the lives of occupants were the adoption of the principles of fire-resisting construction together with careful management and housekeeping; delaying the growth of a fire gave time for workers to escape by the normal routes.

Mr. E. R. Ashill, Chief Officer of the Croydon Fire Brigade, then addressed the Conference on "Industrial fires from the point of view of the Fire Service". He said that the number of industrial fires was increasing although there had not been a corresponding rise in the number of fatal and non-fatal accidents. Half the estimated fire loss for 1955 was due to only 300 out of a total of 100,000 fires attended by fire brigades in Great Britain. There were about 10,000 fires a year in industrial and commercial premises attended by public fire brigades.

The organization of fire brigades had been considerably improved since the war and it was very unusual for inadequacy of personnel or equipment to be encountered when fighting industrial fires. Arrangements for mutual assistance between fire brigades, efficient salvage operations, and the dissemination of technical information had contributed to solving the problem set by the increasing number of fires.

In order to achieve a reduction in the number of industrial fires it was necessary for the principles of fire prevention to be generally recognized and applied. More concern was required on the part of management and more care on the part of the workpeople. Fire protection officers of the Fire Service were always willing to give advice.

Building construction was closely related to fire risk since a fire could be confined within a reasonable area by imperforate walls and ceilings which had a suitable degree of fire resistance. Whenever possible large floor areas should be subdivided. The opening up of walls for piping and the use of flimsy doors was deprecated. It was unfortunate that industry tended to require premises with massive undivided areas for manufacturing and storage purposes. The maximum size of a single compartment in a building should not exceed 250,000 cubic feet, or double this figure if automatic sprinklers were installed. Where building boards were used as a lining for ceilings, etc., they should be of the type having a high degree of fire resistance.

The Factories Act, 1937, required provision to be made for the escape of occupants in case of fire, but only about half of the industrial premises in the country had been inspected and certified. A fire-warning system was also required by the Act. Fire drill was of great value in checking the effectiveness of precautions and should not be neglected.

The detection of fires should not be left to the night watchman; in many cases he was found asleep by the fire brigade when they arrived, and some firms even provided him with a bed. Automatic detection devices were costly but won insurance rebates; in some cases their installation was made a condition for permission by the local authority to erect premises.

The success of fire fighting operations was more probable if information about the topography of premises, processes worked therein, and the nature of materials stored was on record at the local fire service headquarters, along with the location of water supplies, gas cocks and electric switches. It was quite common for access to water to be impeded at night, when nobody was about. Dangerous roofs should also be indicated

so that the fireman could avoid using them. Unprotected openings in floors were a danger to fire fighters working in dense smoke.

The afternoon session opened with a paper by Mr. P. Nash, of the Fire Research Station, on "Fire—its detection and extinction". He quoted figures showing that a reduction in fire losses could best be achieved by studying the reasons why large fires occurred and by improving and spreading knowledge of how best to handle fires in their early stages.

Most large fires were well developed when discovered; the peak periods for the receipt of warnings were between midnight and 4 a.m. and from 6 to 6.30 p.m. An automatic fire detection system could give notice of such outbreaks long before they had become large enough to attract attention.

Heat-sensitive detectors, operating in various ways, were tested by the Joint Fire Research Organization in a special hot air wind tunnel in which the rise in temperature and gas velocities observed in the initial stages of a fire could be reproduced. This enabled the sensitivity of an alarm to be gauged and the correct setting of any adjustment on it to be estimated.

The sprinkler system not only detected a fire, but actively fought it with water sprays before the fire brigade arrived. Although not suited to all types of risk, they had a very good record; many fires would have become large but for the action of sprinklers.

Smoke-sensitive detectors were available which might give the earliest possible warning in many cases, since smoke was usually given off in detectable quantities before appreciable heat was produced. Devices using photocells and ionisation chambers were described. In choosing a detector the possibility that occasional abnormal conditions might set it off had to be borne in mind.

Water was not only the cheapest material, but it also possessed excellent properties for fire fighting. Experiments showed that 12 gallons would extinguish fires of 1,500 cubic feet, all the water being vaporized in steam. A spray of water was better than a jet and easier to use. Water was used to prevent the spread of fires by radiation, and it had been found better to coat the receiving surface by spraying water on to it rather than to use a curtain of water drops as a radiation shield.

Water was also used as a foam, especially for fires of liquid fuels. Important properties of a foam were its expansion, stiffness and drainage rate. Dry, powdered sodium bicarbonate and common salt were good against liquid fires, though there might be a temporary increase of the intensity of radiation which would be dangerous to life. The powders were effective only during application, so it was necessary to make sure that extinction was complete before stopping. Their effect was related to the surface area of powder applied per second. Powders sometimes caused foam to break down, when used together, owing to the presence of a metallic stearate surface coating on the powder particles for promoting easy flow.

Many tests of vaporizing liquids for fire extinguishers had been carried out; chlorobromomethane was very efficient and fluorohydrocarbons were promising. Flat and fan-shaped sprays were best. A floating detector and C.B. sprayhead had been developed for use in tanks of inflammable liquids.

A paper on "First-aid for casualties from fire" was read by Mr. D. McG. Jackson, Surgeon-in-charge of the Industrial Injuries and Burns Research Unit of the Birmingham Accident Hospital.

The danger from burns was that the blood capillaries leaked plasma, roughly in proportion to the area burnt, and serious plasma loss, added to the skin injury, produced shock, kidney damage and sometimes death, owing to there remaining an insufficient volume of blood in circulation. A burn, also, was an open wound which could not be closed by sutures like a laceration, and it was therefore peculiarly liable to infection.

Time was the most important consideration in the first-aid treatment of burns. Permanent damage from shock, no longer reversible by transfusion, might result within a few hours of an accident. Urgent transfer to hospital without wasting time, with rest, drinks, etc., was essential.

Little first-aid treatment could be given; the best was to reassure the victim that urgent arrangements were under way to get him to hospital. Severe burns were often painless so sedatives were not required. Pain from small burns could be relieved by bathing in cold tap water. Shocked patients should not be warmed artificially and the administration of fluids should be limited.

The only local treatment for a thermal burn was to cover it with a sterile cloth to prevent infection; ointments, lotions, etc., should not be applied, nor should blisters be broken nor dead skin removed.

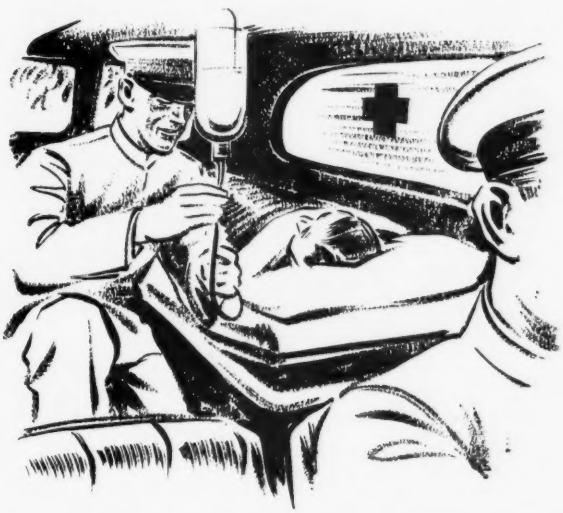
Chemical burns required immediate washing with plenty of water. This was extremely urgent and a delay of seconds might have serious consequences.

Burns of the respiratory system might be associated with poisoning by carbon monoxide or fumes; this condition was very serious indeed and needed immediate hospital treatment.

In organizing the transport of burn cases to hospital it should be remembered that patients would travel 20 to 30 miles without resuscitation immediately after injury better than they would the following day.

The seriousness of a burn depended very much upon whether the skin was destroyed throughout a part of its depth only, or whether the total thickness was burnt. The former healed rapidly but the latter, when more than an inch or so in diameter, might take weeks to heal unless grafted, and would leave permanent scarring.

When delay in getting burned men to hospital was inevitable, plasma transfusion on the site, or during transit in the ambulance, might be necessary to control shock. Ideally transfusion should be done within four hours of the accident. As a rule, however, the nearest hospital was the best place for the job.



Speaking of "Managerial responsibilities and fire prevention", Mr. H. Mason Bibby, of J. Bibby & Son, Liverpool, referred to the risk due to the storage of organic or carbon-containing materials in bulk. There were well-established codes of practice for the safe storage of coal whereby too great a rise in temperature by spontaneous combustion was prevented. Some power stations stored their coal under water, not only to eliminate the fire risk, but also to avoid waste due to oxidation and evaporation of volatile constituents.

Fires of palm kernels had occurred at various ports, particularly when they were stored in sacks. The kernels contained about 45 per cent of a readily oxidizable oil which was exuded on to the sacks when damage occurred in handling. The coarse material of the sack brought about a very effective exposure of the oil to oxidation, while piling of the sacks restricted the access of cooling air with a resultant rapid rise in temperature.

The responsibility of management towards ensuring safe storage and tidiness included the building of positive measures into the premises to enable cleanliness to be a natural habit, and the breaking of the premises down into cells of limited size.

A special risk was associated with high speed machinery, especially disintegrators which could generate sparks hot enough to ignite the material being handled. Flushing with plenty of air was a safeguard, but the possible consequences of a blockage should be remembered. Separators for ground material were always a potential danger, because the airborne concentration would at some time pass through the valve at which ignition was most likely. A violent explosion might take place, hence separators should always be isolated.

Repairs and maintenance work on plant was often dangerous because it was impossible to remove each unit to a safe place for attention. A time schedule might discourage sufficient cleaning and draining before welding was started. In a large, continuous process shop, without fire breaks, the devastating possibilities had been demonstrated recently.

Magnesium swarf was a dangerous material and attempts to extinguish a fire with water could release hydrogen. Most plastics were inflammable and were a source of danger when handled by small processors who were unaware of the fire risk.

Attention had to be given, also, to preventing small fires from becoming conflagrations. In the absence of automatic equipment, trained, able-bodied patrolmen were essential. The elderly night watchman, sleeping in a hut, was useless.

Fire resistance should be anticipated in designing buildings so that they would resist collapse for long enough to enable a fire to be dealt with before it became extensive. Advice on such matters and on other precautions was readily available from the Fire Protection Association.

The full proceedings of the Conference, complete with illustrations, are being published by the Society and can be obtained for 10s.6d., post free, from the Hon. Scientific Secretary, M.R.C. Laboratories, Holly Hill, London, N.W.3.

CONFERENCES

INDUSTRIAL HEALTH CONFERENCE

The 15th Annual Conference of the American Association of Industrial Nurses will be held in conjunction with those of the Industrial Medical Association, American Industrial Hygiene Association, American Conference of Governmental Industrial Hygienists, and American Association of Industrial Dentists. The Conference will convene in Kiel Auditorium, St. Louis, April 22-25, 1957.

AAIN is planning sessions to cover such subjects as rehabilitation of the industrially injured, records, manuals of procedures, non-occupational conditions encountered in industry. The annual business meeting of the Association will be on Tuesday morning, April 23rd.

The St. Louis Industrial Nurses Association, as hostess association, urges all industrial nurses to plan now to attend the Conference.

The Annual Banquet which will be at the Sheraton-Jefferson Hotel on Thursday, April 25th, is the highlight of the Conference.

Industrial managements should begin now to arrange for their interested personnel to attend the Conference. Those who attend and their employers will richly benefit through the mutual interchange of experience and ideas.

Doctors, dentists, nurses, industrial hygiene engineers, and others concerned with employee health should find the Conference a worthwhile experience. The program for the entire Conference should be complete and in the mail shortly from the office of the Conference Chairman.

STUDY CONFERENCE IN HEALTH EDUCATION

The Central Council for Health Education, London, England, is arranging two international study conferences in Health Education primarily concerned with Health Education of the Public:

1. *Seminar for Public Health Workers Overseas.*

This seminar, the subject of which is "The Principles, Methods and Media of Health Education" is being held on April 15th-19th, 1957 and is arranged principally for delegates attending the Royal Society of Health Congress in April. It has been planned to meet the special needs of field-workers from overseas and will provide an opportunity to study the broad principles of programme planning, evaluation, and organization, and the use of methods and media. The fee for tuition and full residence is £7.8s.0d.

2. *Summer School in Health Education.*

This School dealing with "The Promotion of Health and the Techniques of Health Education" is scheduled for August 20th-30th, 1957. It is a working conference for doctors, nurses, health inspectors, teachers, and auxiliary health and social welfare workers from various fields and different countries. It will devote attention to new content of Health Education, community attitudes and motivation, effective methods of group and community education, and the evaluation of results. In addition the programme will offer an intensive practical course in the production and use of teaching materials with demonstrations of how these can be adapted to local conditions.

For additional information on these Conferences write to: The Central Council for Health Education, Tavistock House North, Tavistock Square, London, W.C.1, England.

CONFERENCE — THE BRITISH OCCUPATIONAL HYGIENE SOCIETY

It is proposed that the seventh conference of the Society shall be held in London, April 16th and 17th, 1957. The topic of discussion will be "INSTRUMENTS FOR USE IN OCCUPATIONAL HYGIENE". The Conference will be spread over two days and the programme will be arranged to include papers and also periods of discussion on the various aspects of the problem of instrumentation in occupational hygiene.

The papers presented will include considerations of instruments used in the determination of airborne dusts and gases, in biochemical and X-ray laboratories, and in the field of atomic radiation. The detailed programme will be circulated shortly.

This conference will be open to non-members on payment of a registration fee of a guinea.

The meetings will be held in Canterbury Hall in Cartwright Gardens, which is just at the back of the B.M.A. building, off Woburn Place. Lunch and tea will be available on both days.

Accommodation on the night of April 16th will be available for about 50 persons in Bentham Hall, which is also in Cartwright Gardens. This is a University Hall of Residence, very similar to University Hall in Liverpool where the meeting was held last April. It may also prove possible to arrange for people to stay in Bentham Hall on the nights before and after the conference.

The possibility of holding a Conference Dinner on the evening of April 16th is under consideration.

It is hoped that as many people as possible will stay in the Hall and so help to foster the spirit of a residential conference. Bentham Hall has a spacious common room which would be available for the use of residents.

Full programmes and announcements in the scientific press will appear in due course.

Anyone wishing to attend should contact: Hon. Scientific Secretary, D. Turner, Environmental Hygiene Research Unit, M. R. C. Laboratories, Holly Hill, Hampstead, London, N.W. 3, England.

HYGIENIC GUIDE SERIES

(Continued from page 5)

ethyl alcohol, fluoride-bearing dusts and fumes, fluorine, formaldehyde, hydrogen cyanide, hydrogen fluoride, hydrogen sulfide, mercury, nitrogen dioxide, sulfur dioxide, 1,1,1-trichloroethane (methyl chloroform), and zinc oxide.

Copies of the Guides are available from the American Industrial Hygiene Association, 14125 Prevost, Detroit 27, Michigan, at 25 cents each. Remittance must accompany orders for $2.00 or less. A discount of 20% is allowed on orders for five or more with 40% allowed on orders for 100 or more. Each Guide is a single sheet. Loose leaf binders are available at $1.25 each.

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